CLOSE PATENT

FIG. 1

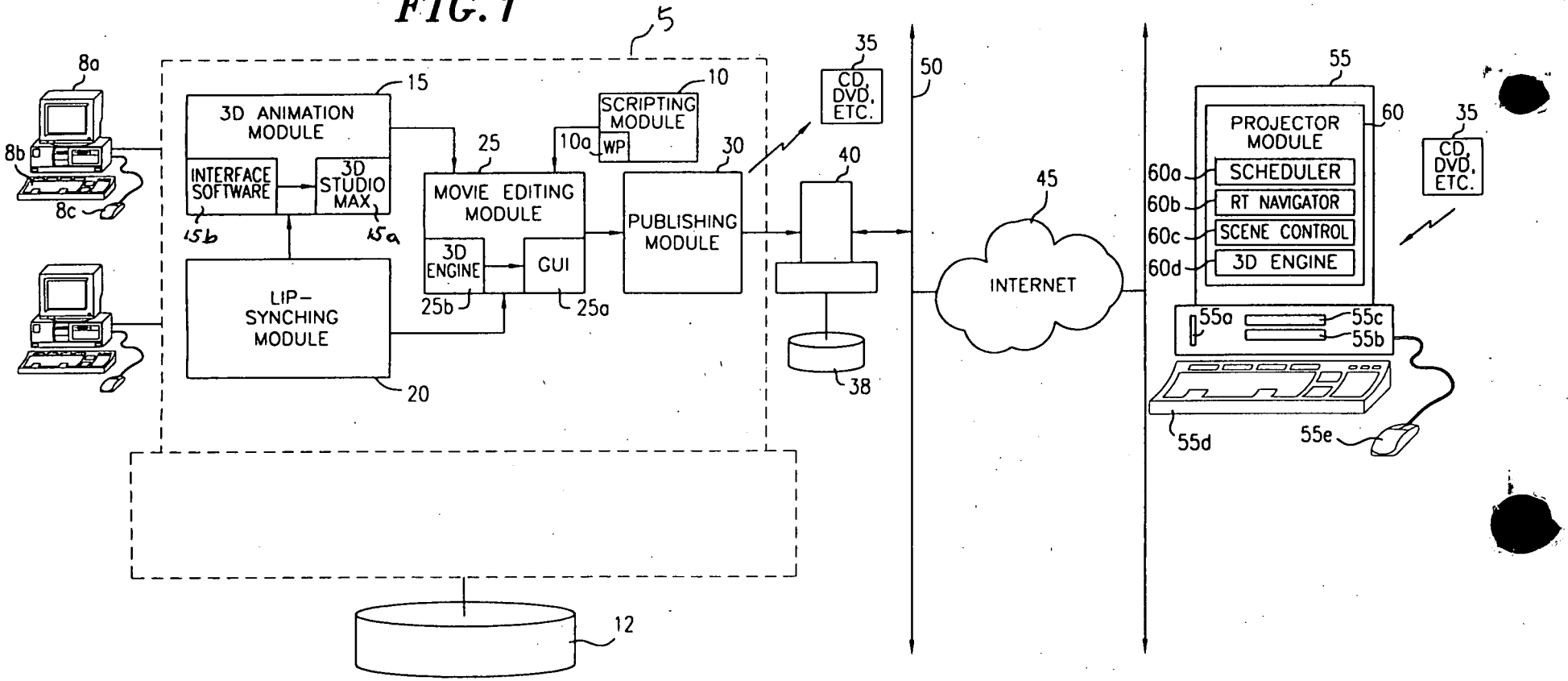
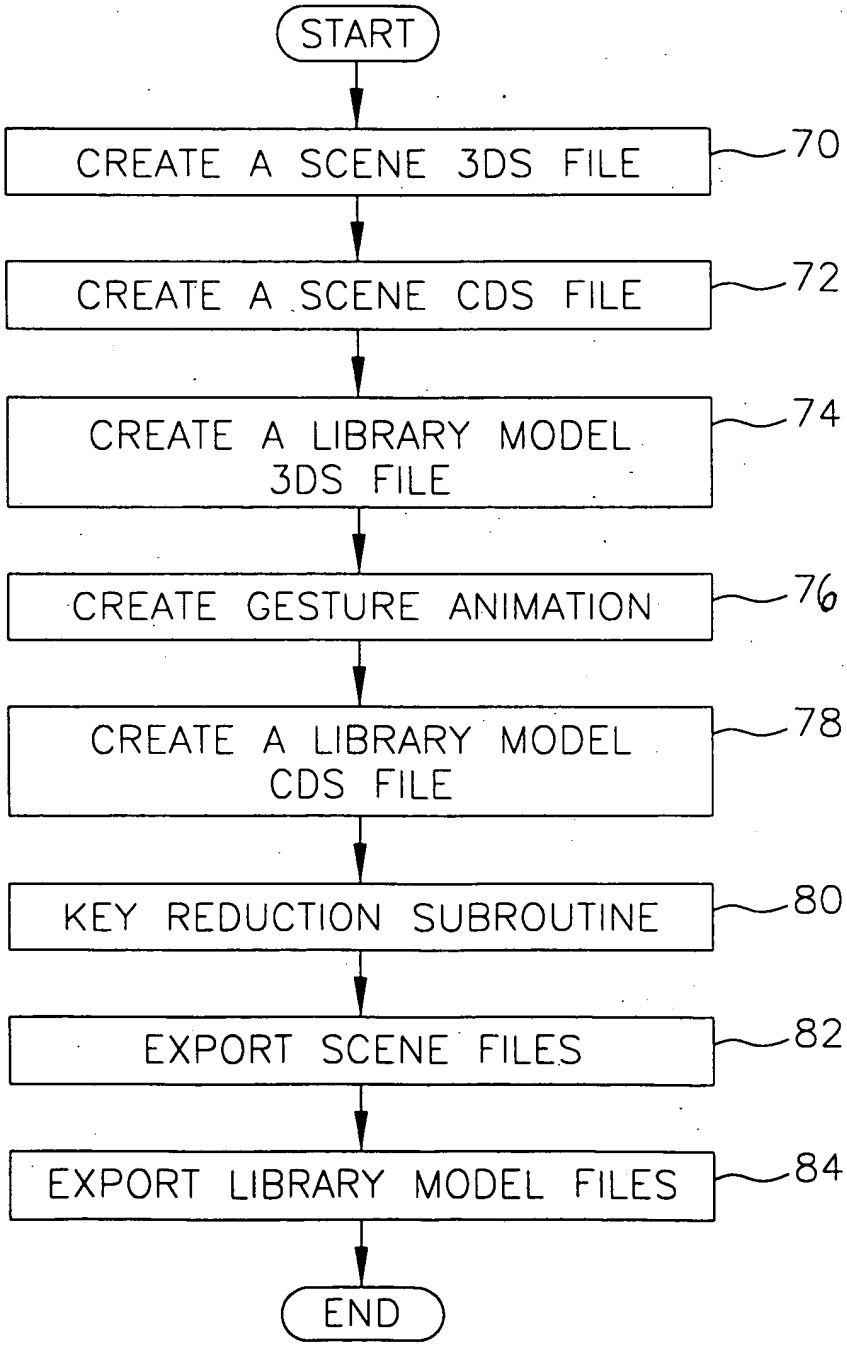


FIG. 2


START
CREATE A SCENE 3DS FILE
70
CREATE A SCENE CDS FILE
72
CREATE A LIBRARY MODEL 3DS FILE
74
CREATE GESTURE ANIMATION
76
CREATE A LIBRARY MODEL CDS FILE
78
KEY REDUCTION SUBROUTINE
80
EXPORT SCENE FILES
82
EXPORT LIBRARY MODEL FILES
84
END

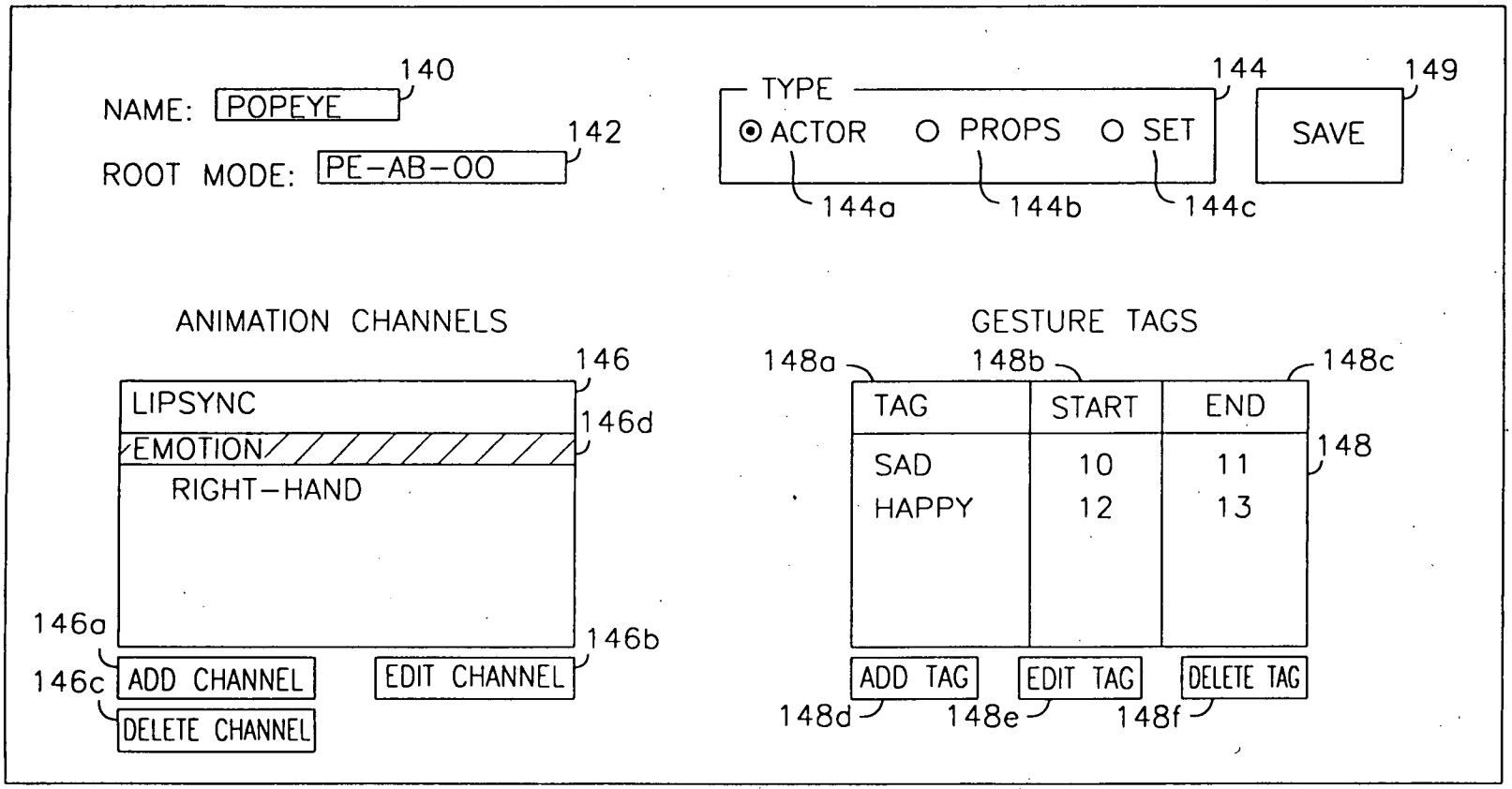
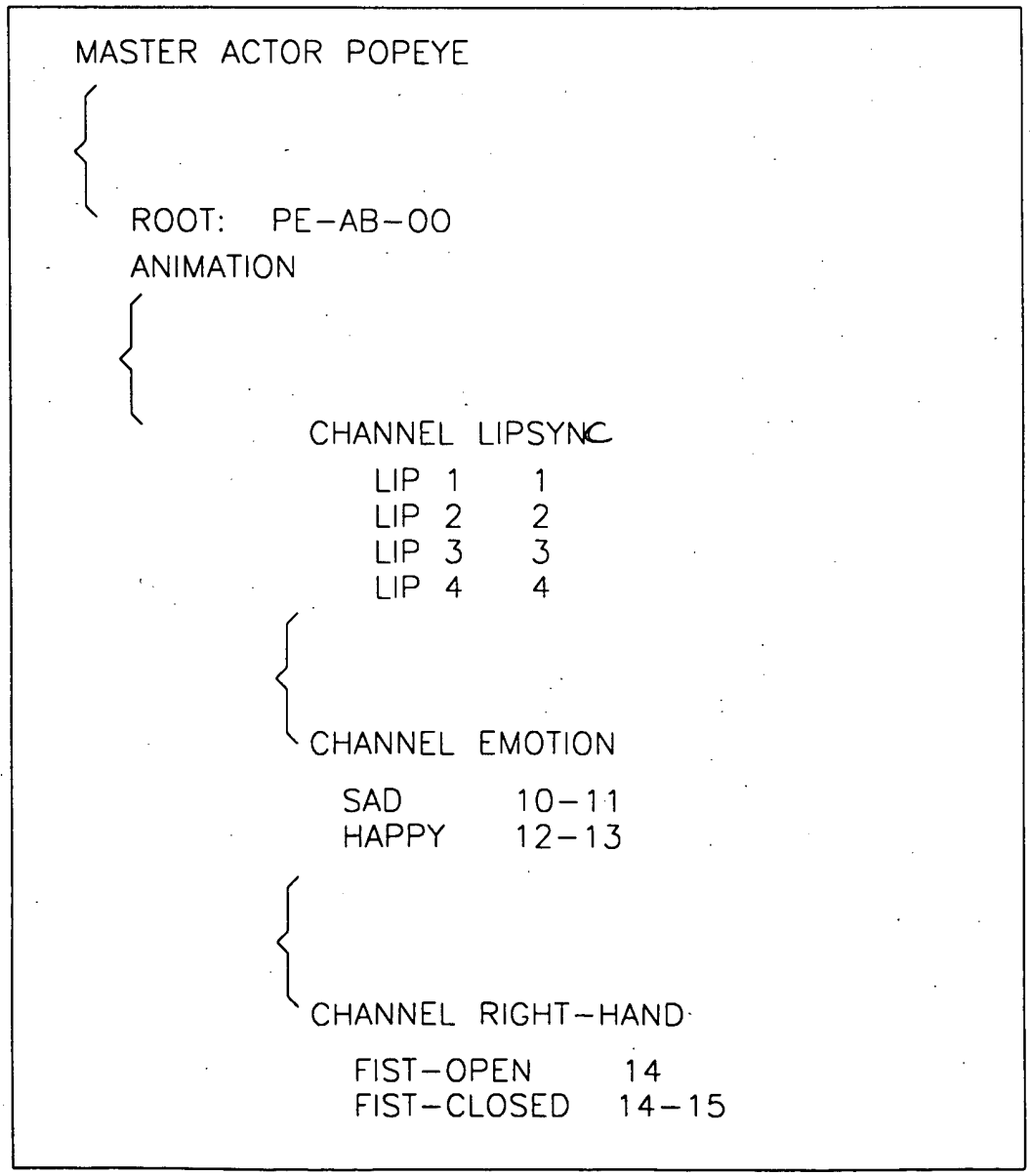

NAME: POPEYE
140
ROOT MODE: PE-AB-00
142
TYPE
ACTOR
PROPS
SET
144
144a
144b
144c
SAVE
149
ANIMATION CHANNELS
146
LIPSYNC
EMOTION
RIGHT-HAND
146d
146a
146b
146c
ADD CHANNEL
EDIT CHANNEL
DELETE CHANNEL
GESTURE TAGS
148a
148b
148c
TAG
START
END
SAD
10
11
HAPPY
12
13
148
ADD TAG
EDIT TAG
DELETE TAG
148d
148e
148f

FIG. 3A

FIG.3B


MASTER ACTOR POPEYE
ROOT: PE-AB-00
ANIMATION
CHANNEL LIPSYNC
LIP 1 1
LIP 2 2
LIP 3 3
LIP 4 4
CHANNEL EMOTION
SAD 10-11
HAPPY 12-13
CHANNEL RIGHT-HAND
FIST-OPEN 14
FIST-CLOSED 14-15

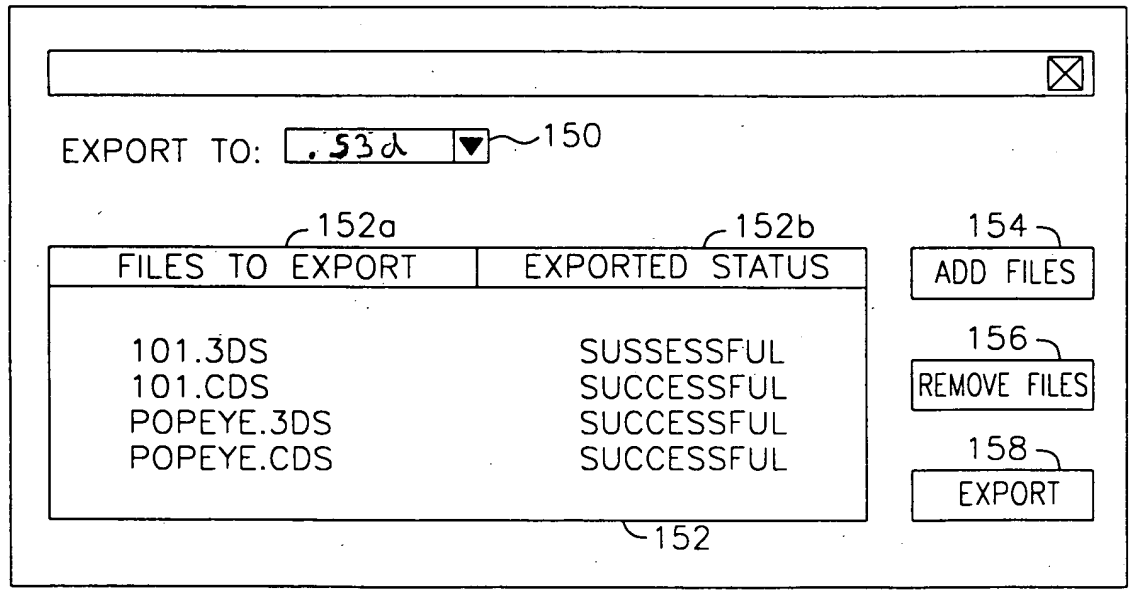

EXPORT TO: .53d
150
152a
152b
154
FILES TO EXPORT
EXPORTED STATUS
ADD FILES
101.3DS
SUSSESSFUL
101.CDS
SUCCESSFUL
POPEYE.3DS
SUCCESSFUL
POPEYE.CDS
SUCCESSFUL
156
REMOVE FILES
158
EXPORT
152

FIG. 4

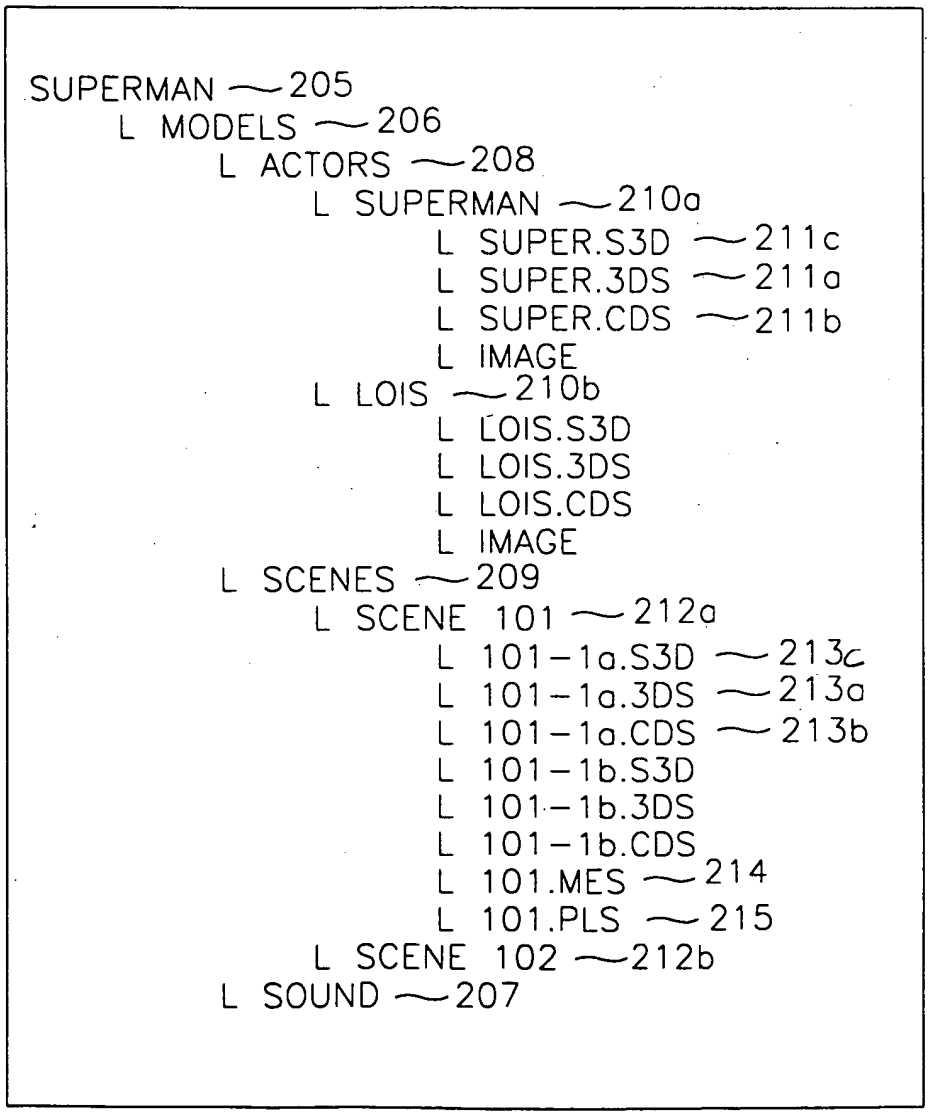

SUPERMAN ~205
L MODELS ~206
L ACTORS ~208
L SUPERMAN ~210a
L SUPER.S3D ~211c
L SUPER.3DS ~211a
L SUPER.CDS ~211b
L IMAGE
L LOIS ~210b
L LOIS.S3D
L LOIS.3DS
L LOIS.CDS
L IMAGE
L SCENES ~209
L SCENE 101 ~212a
L 101-1a.S3D ~213c
L 101-1a.3DS ~213a
L 101-1a.CDS ~213b
L 101-1b.S3D
L 101-1b.3DS
L 101-1b.CDS
L 101.MES ~214
L 101.PLS ~215
L SCENE 102 ~212b
L SOUND ~207

FIG.5

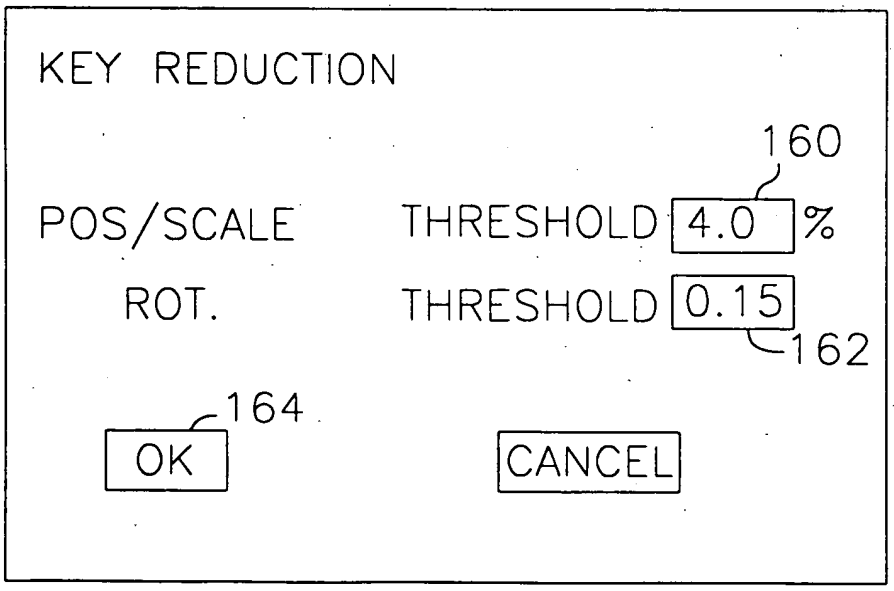

KEY REDUCTION
160
POS/SCALE
THRESHOLD
4.0
%
ROT.
THRESHOLD
0.15
162
164
OK
CANCEL

FIG.6

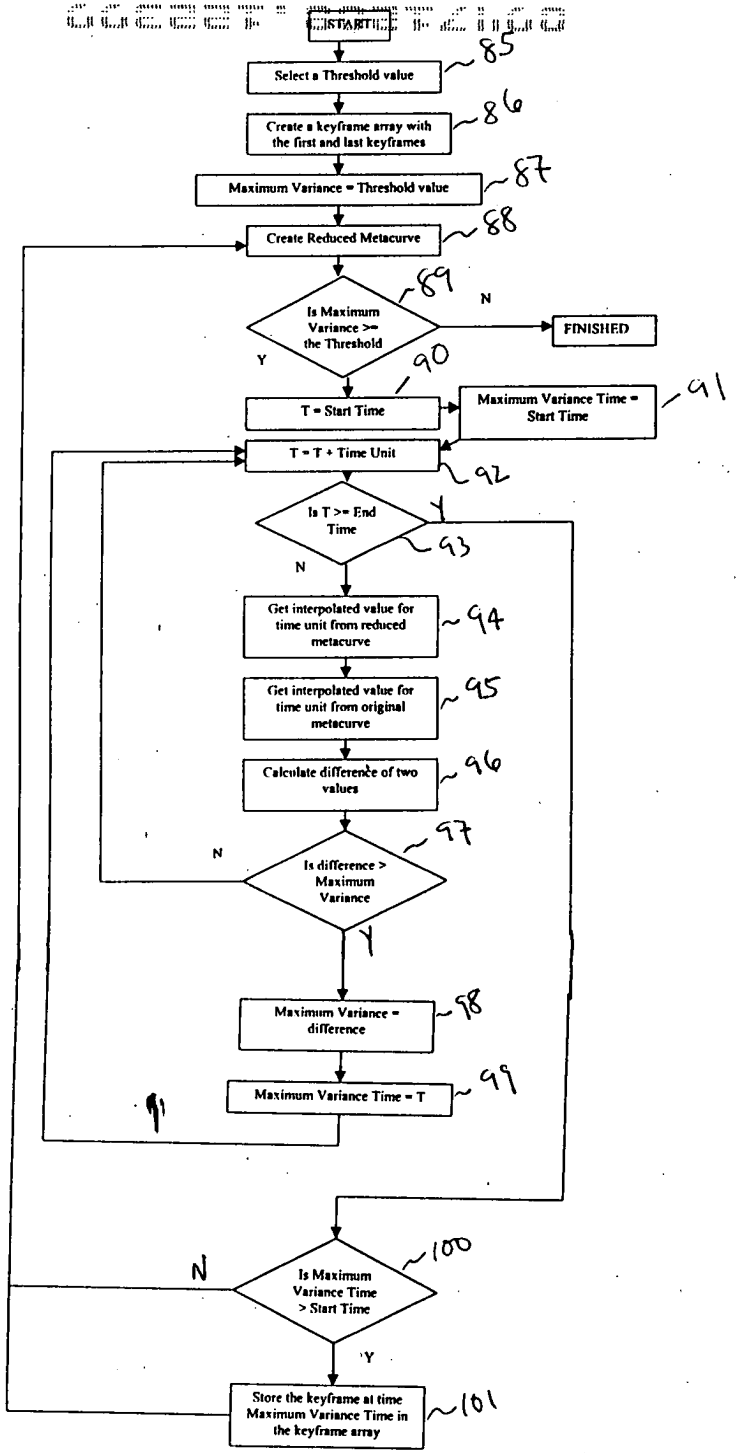
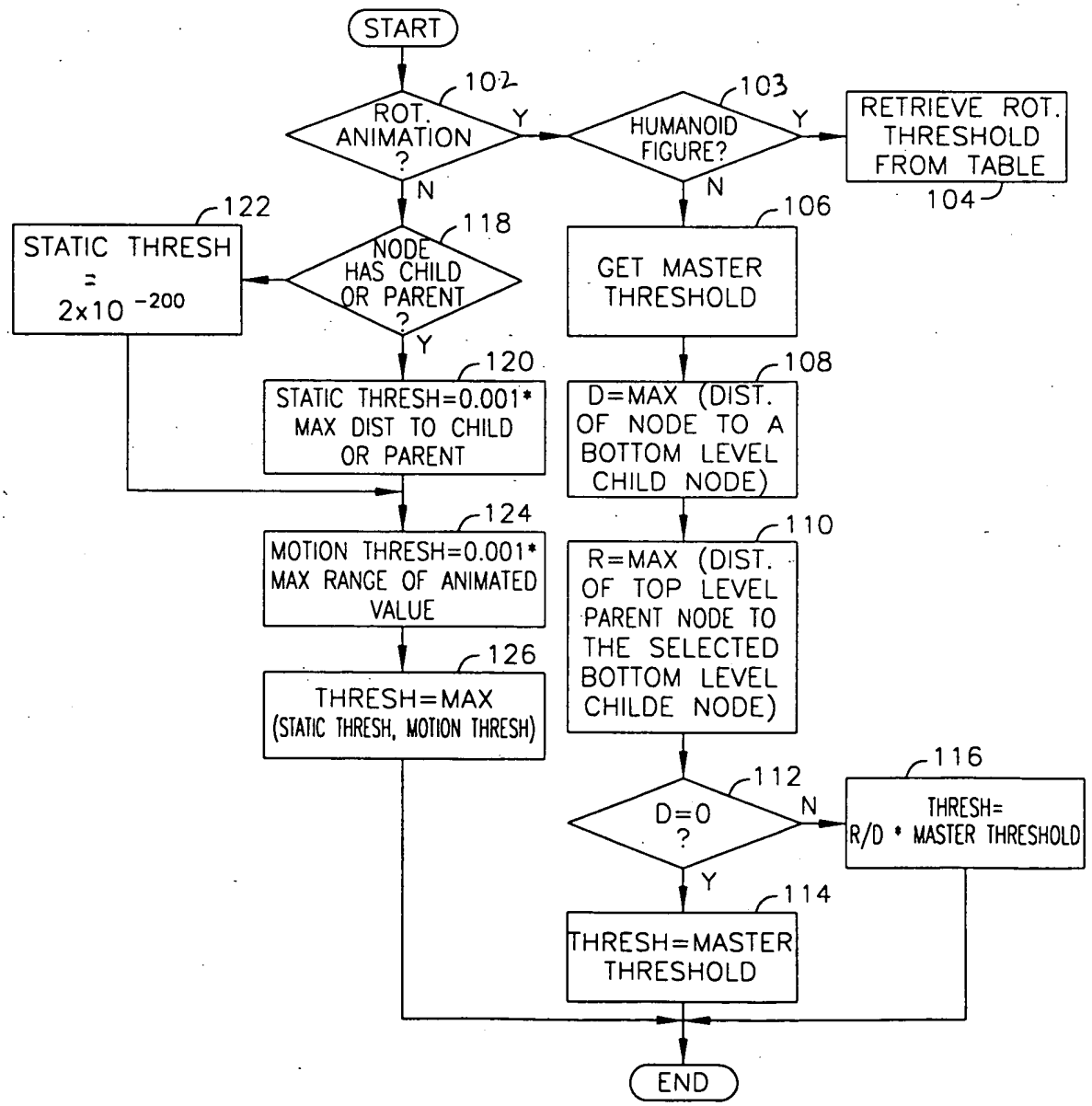

START
Select a Threshold value
85
Create a keyframe array with the first and last keyframes
86
Maximum Variance = Threshold value
87
Create Reduced Metacurve
88
Is Maximum Variance >= the Threshold
89
N
FINISHED
Y
T = Start Time
90
Maximum Variance Time = Start Time
91
T = T + Time Unit
92
Is T >= End Time
93
Y
N
Get interpolated value for time unit from reduced metacurve
94
Get interpolated value for time unit from original metacurve
95
Calculate difference of two values
96
Is difference > Maximum Variance
97
N
Y
Maximum Variance = difference
98
Maximum Variance Time = T
99
91
Is Maximum Variance Time > Start Time
100
N
Y
Store the keyframe at time Maximum Variance Time in the keyframe array
101

Fig. 7

FIG.8


START
ROT. ANIMATION ?
102
Y
N
HUMANOID FIGURE?
103
Y
N
RETRIEVE ROT. THRESHOLD FROM TABLE
104
GET MASTER THRESHOLD
106
D=MAX (DIST. OF NODE TO A BOTTOM LEVEL CHILD NODE)
108
R=MAX (DIST. OF TOP LEVEL PARENT NODE TO THE SELECTED BOTTOM LEVEL CHILDE NODE)
110
D=0 ?
112
N
Y
THRESH= R/D * MASTER THRESHOLD
116
THRESH=MASTER THRESHOLD
114
NODE HAS CHILD OR PARENT ?
118
Y
N
STATIC THRESH = 2x10 -200
122
STATIC THRESH=0.001* MAX DIST TO CHILD OR PARENT
120
MOTION THRESH=0.001* MAX RANGE OF ANIMATED VALUE
124
THRESH=MAX (STATIC THRESH, MOTION THRESH)
126
END

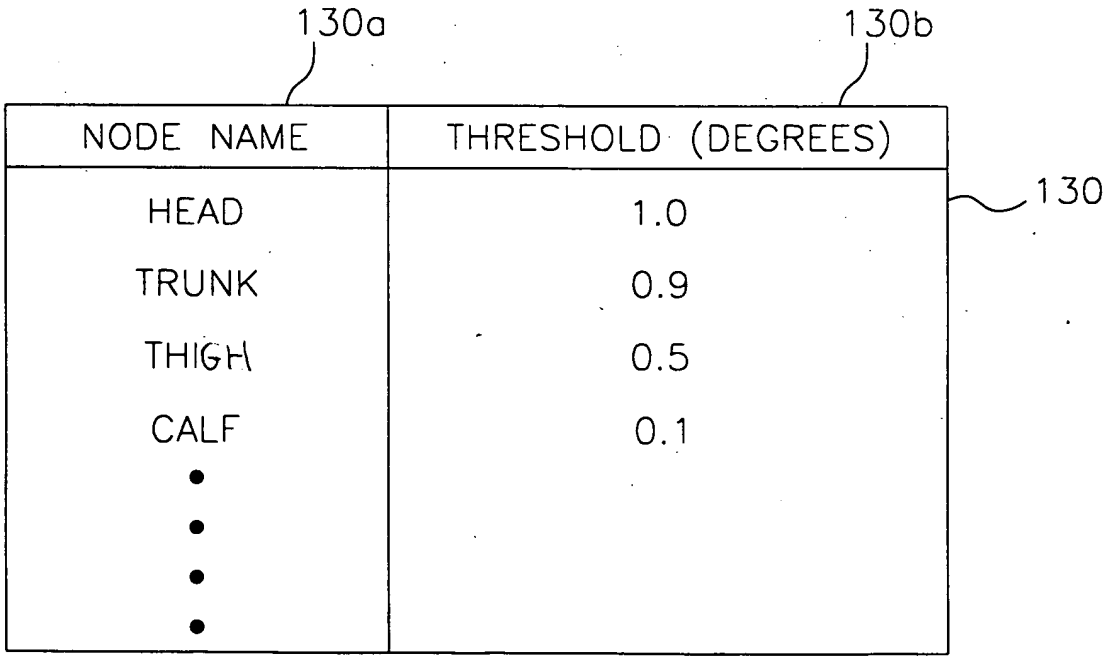
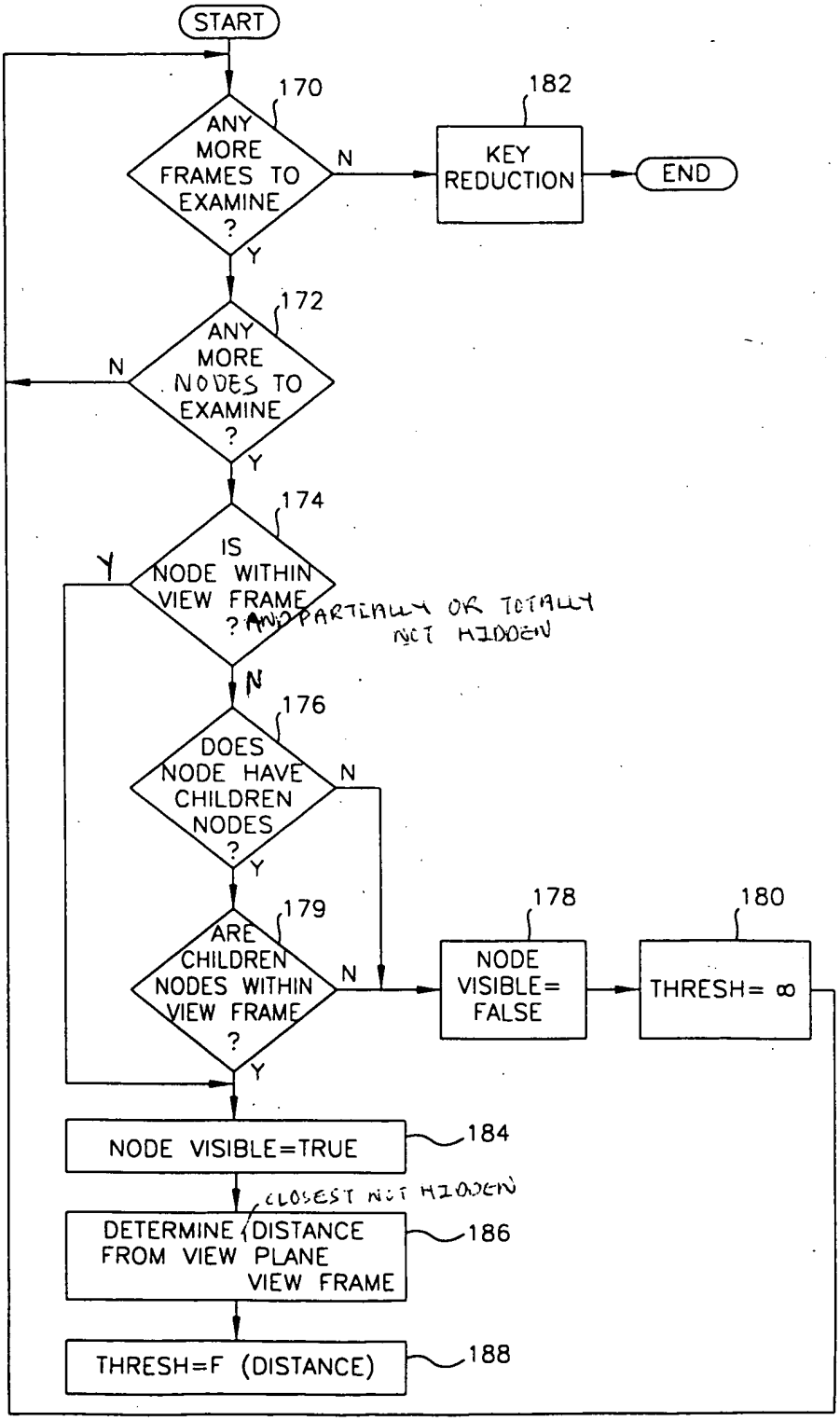

130a
130b
NODE NAME
THRESHOLD (DEGREES)
HEAD
1.0
TRUNK
0.9
THIGH
0.5
CALF
0.1
130

FIG. 9

FIG. 10


START
170
ANY MORE FRAMES TO EXAMINE ?
N
182
KEY REDUCTION
END
Y
172
ANY MORE NODES TO EXAMINE ?
N
Y
174
IS NODE WITHIN VIEW FRAME ?
Y
AND PARTIALLY OR TOTALLY NOT HIDDEN
N
176
DOES NODE HAVE CHILDREN NODES ?
N
Y
179
ARE CHILDREN NODES WITHIN VIEW FRAME ?
N
178
NODE VISIBLE= FALSE
180
THRESH= ∞
Y
NODE VISIBLE=TRUE
184
CLOSEST NOT HIDDEN
DETERMINE DISTANCE FROM VIEW PLANE VIEW FRAME
186
THRESH=F (DISTANCE)
188

190a FRAME	190b TIME	190c WIDE WAVE	THRESHOLD VALUE	
			190e ROT.	190d 190f POS./SCALE
1	0.04	SUPER-HEAD	0.9	0.5
1	0.04	SUPER-TRUNK	0.8	0.5
2	0.08	LOIS-HEAD	0.9	0.6
2	0.08	LOIS-HEAD	∞	∞
2	0.08	LOIS-LEG-LEFT	∞	∞
		LOISE-LEG-RIGHT		

FIG. 11

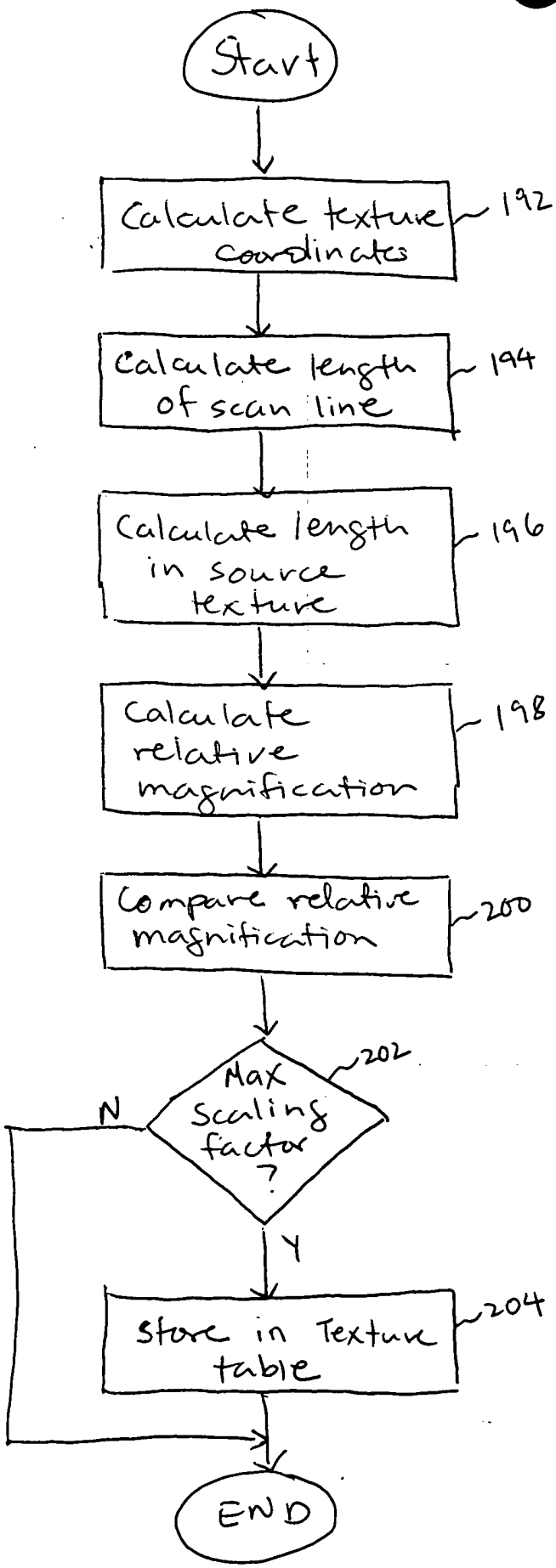
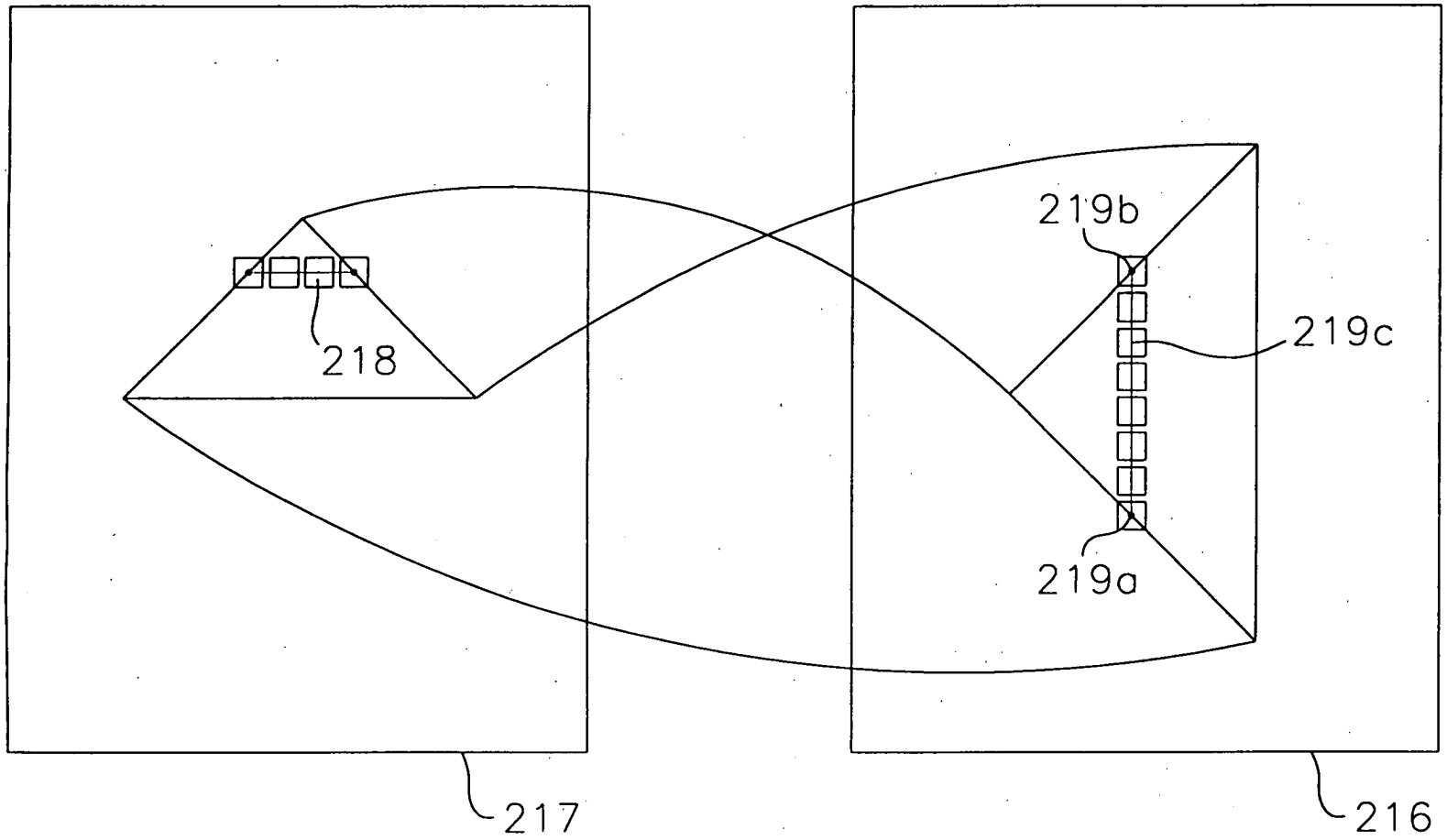

Start
Calculate texture coordinates
192
Calculate length of scan line
194
Calculate length in source texture
196
Calculate relative magnification
198
Compare relative magnification
200
Max Scaling factor ?
202
N
Y
Store in Texture table
204
END

Fig. 12

US 6,067,062

FIG. 13



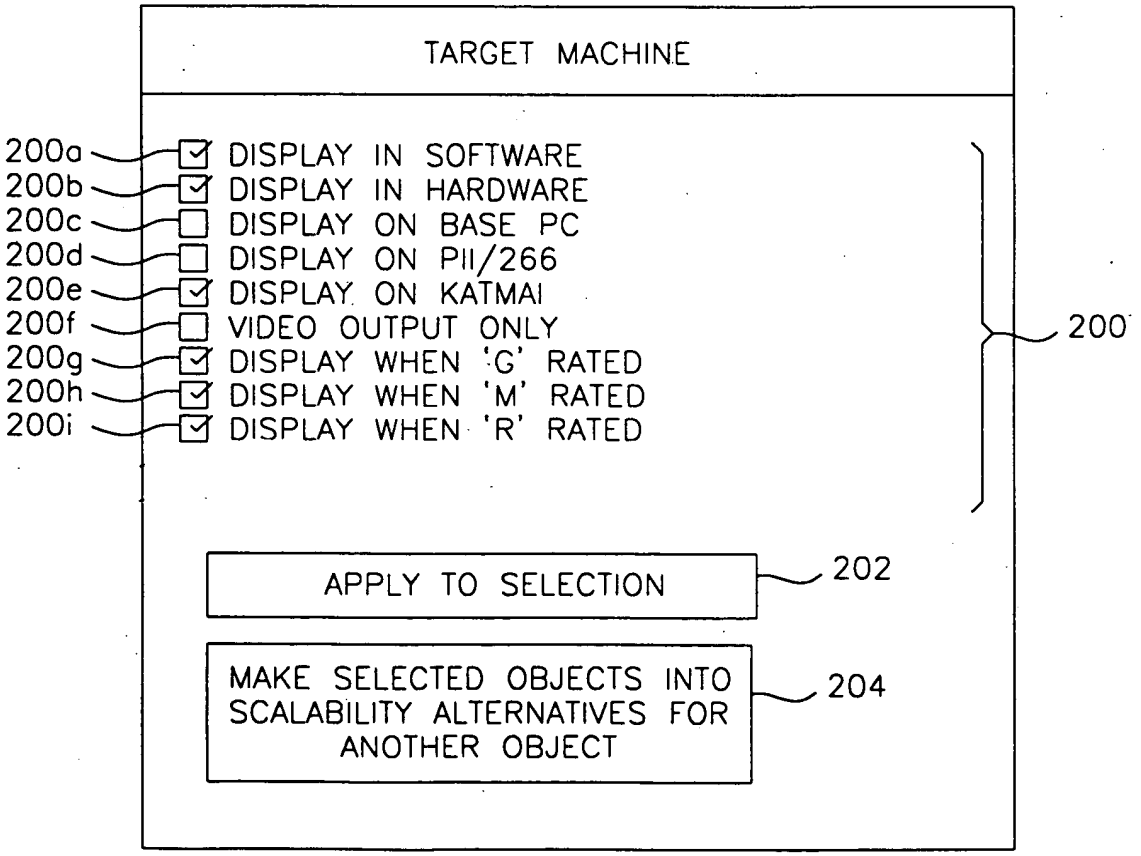

TARGET MACHINE
200a
DISPLAY IN SOFTWARE
200b
DISPLAY IN HARDWARE
200c
DISPLAY ON BASE PC
200d
DISPLAY ON PII/266
200e
DISPLAY ON KATMAI
200f
VIDEO OUTPUT ONLY
200g
DISPLAY WHEN 'G' RATED
200h
DISPLAY WHEN 'M' RATED
200i
DISPLAY WHEN 'R' RATED
200
APPLY TO SELECTION
202
MAKE SELECTED OBJECTS INTO SCALABILITY ALTERNATIVES FOR ANOTHER OBJECT
204

FIG. 14

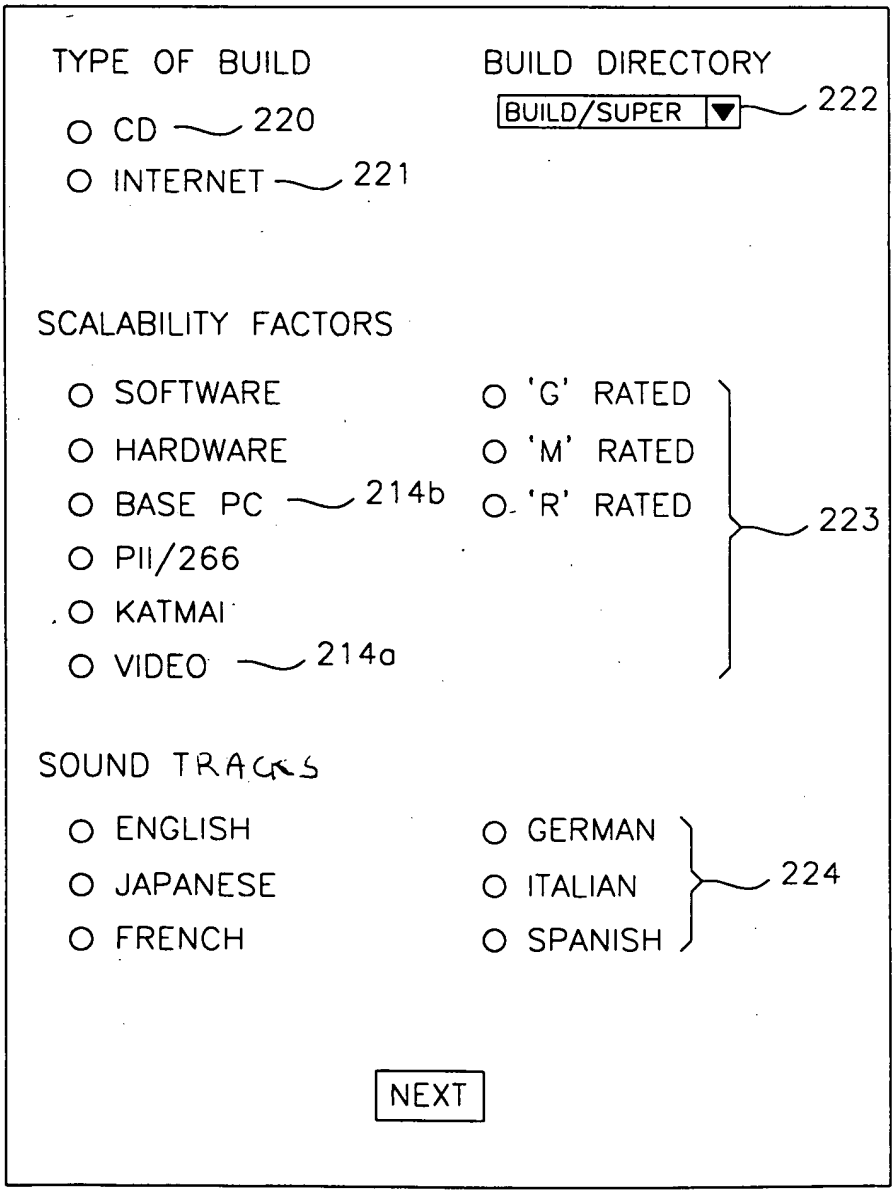

TYPE OF BUILD
CD
220
INTERNET
221
BUILD DIRECTORY
BUILD/SUPER
222
SCALABILITY FACTORS
SOFTWARE
HARDWARE
BASE PC
214b
PII/266
KATMAI
VIDEO
214a
'G' RATED
'M' RATED
'R' RATED
223
SOUND TRACKS
ENGLISH
JAPANESE
FRENCH
GERMAN
ITALIAN
SPANISH
224
NEXT

FIG. 15A

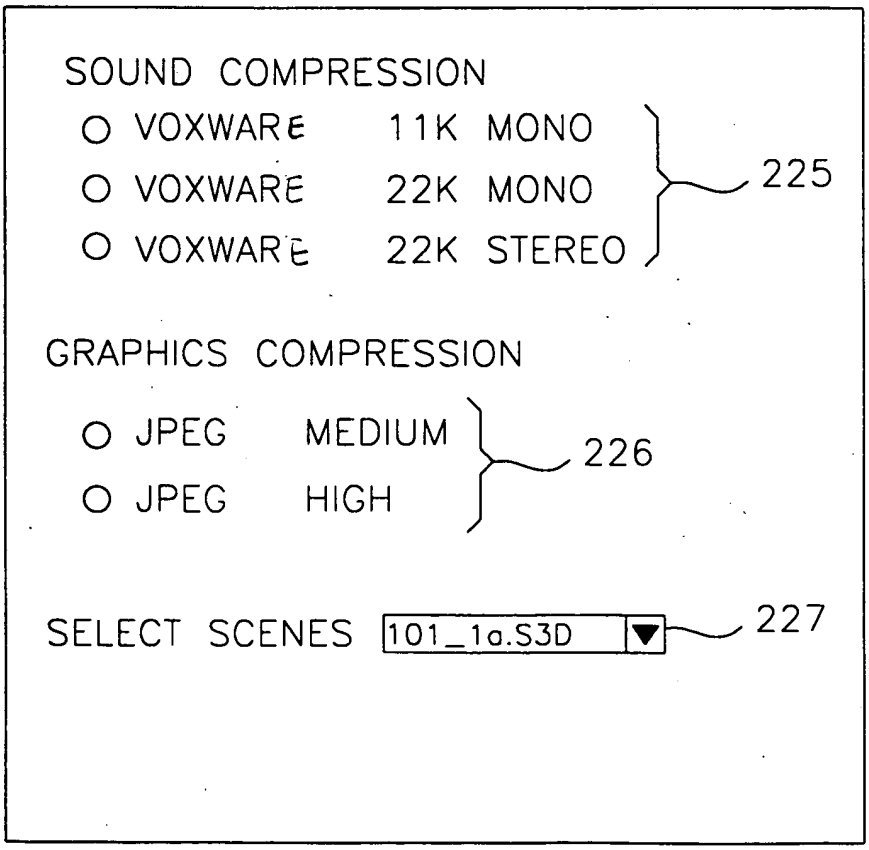

SOUND COMPRESSION
O VOXWARE 11K MONO
O VOXWARE 22K MONO
O VOXWARE 22K STEREO
225
GRAPHICS COMPRESSION
O JPEG MEDIUM
O JPEG HIGH
226
SELECT SCENES
101_1a.S3D
227

FIG. 15B

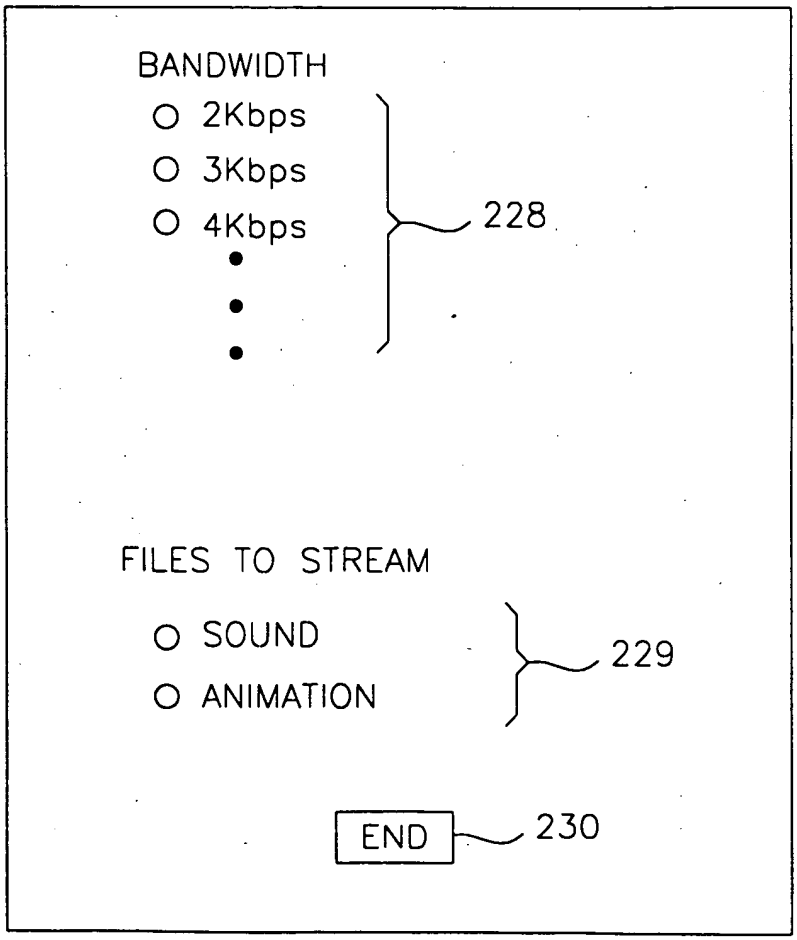

BANDWIDTH
2Kbps
3Kbps
4Kbps
228
FILES TO STREAM
SOUND
ANIMATION
229
END
230

FIG. 15C

Fig. 16A

Name (232a)	Location (232b)	Type (232c)	Version (232d)	Compressed Size (232e)	Size (232f)	Offset (232g)
Super.S3D	1	7	1	150K	200K	450K
Scene101.S3D	1	7	1	20K	30K	670K

232

Fig. 16B

Name	Location	Type	Version	Size	Stream Number (232h)	Stream File Index (232i)
Scene101.S3D_STREAM	5	7	1	100K	0	0
Hello.WAV	5	2	1	300K	1	0

232

Fig. 16C

Name	Location	Type	Version	Size	Start Time	Extra Size	Extra Pos
Scene101.dat	7	12	1	350K	-10	50K	800K

232

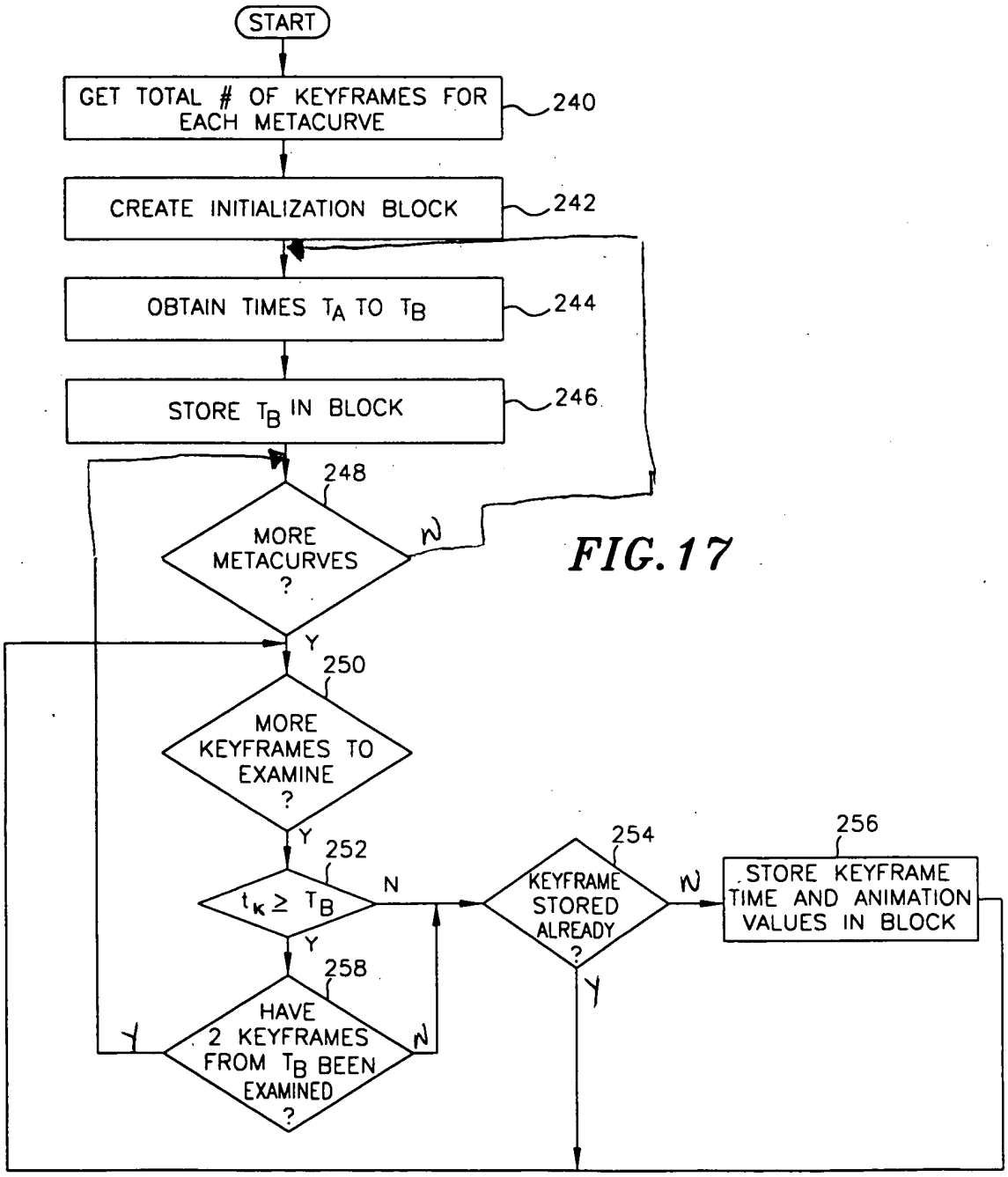

START
GET TOTAL # OF KEYFRAMES FOR EACH METACURVE
240
CREATE INITIALIZATION BLOCK
242
OBTAIN TIMES T_A TO T_B
244
STORE T_B IN BLOCK
246
248
MORE METACURVES ?
N
Y
250
MORE KEYFRAMES TO EXAMINE ?
Y
252
$t_K \geq T_B$
N
Y
254
KEYFRAME STORED ALREADY ?
N
Y
256
STORE KEYFRAME TIME AND ANIMATION VALUES IN BLOCK
258
HAVE 2 KEYFRAMES FROM T_B BEEN EXAMINED ?
Y
N

FIG. 17

FIG. 18

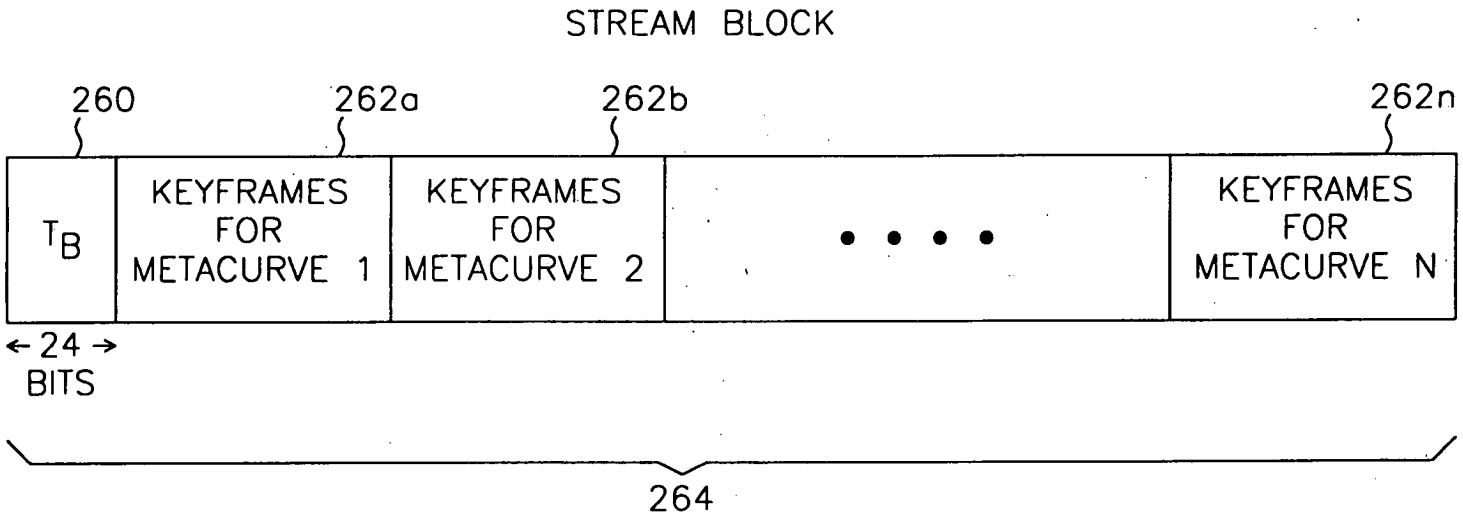
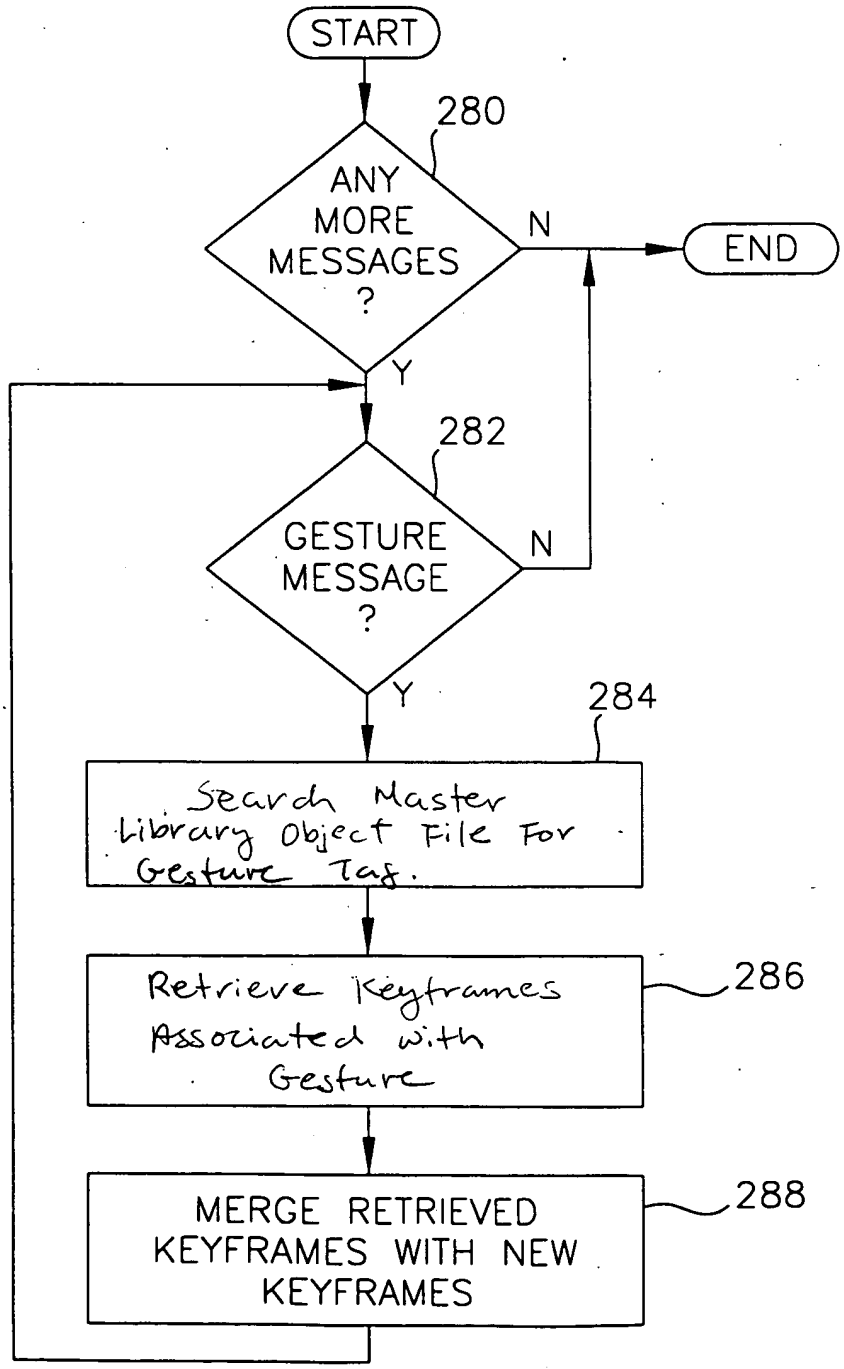

STREAM BLOCK
260
262a
262b
262n
T_B
KEYFRAMES FOR METACURVE 1
KEYFRAMES FOR METACURVE 2
KEYFRAMES FOR METACURVE N
← 24 →
BITS
264

FIG. 19


START
280
ANY MORE MESSAGES ?
N
END
Y
282
GESTURE MESSAGE ?
N
Y
284
Search Master Library Object File For Gesture Tag.
Retrieve Keyframes Associated with Gesture
286
MERGE RETRIEVED KEYFRAMES WITH NEW KEYFRAMES
288

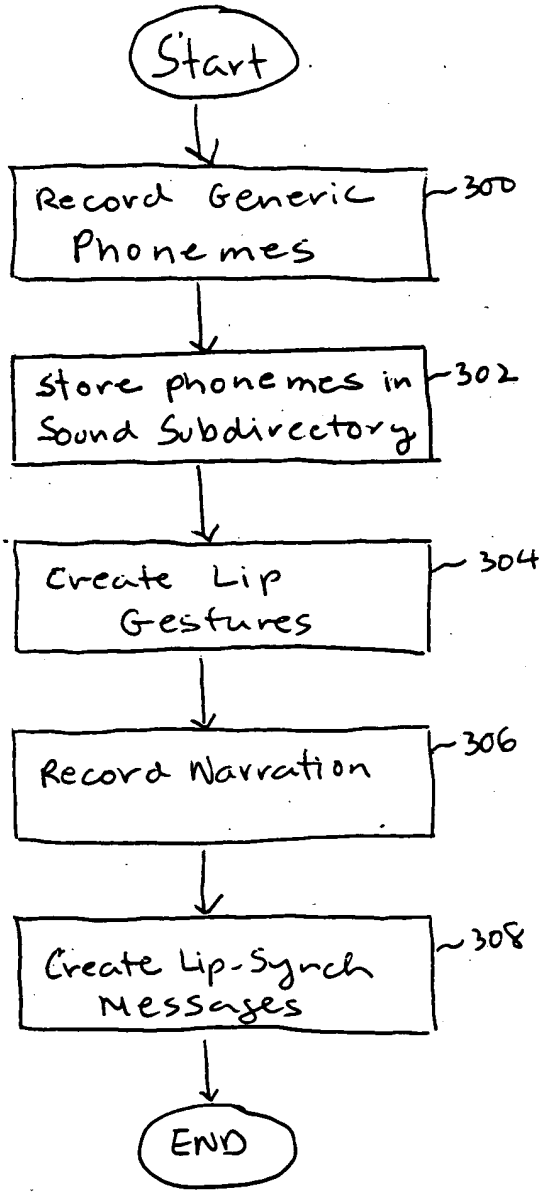

Start
Record Generic Phonemes
300
Store phonemes in Sound Subdirectory
302
Create Lip Gestures
304
Record Narration
306
Create Lip-Synch Messages
308
END

Fig. 20